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nity to which Pictet and other writers have accustomed us. The early Aryan comes before us as a coarse and uncivilized nomad, unacquainted with the use of metals, and protecting himself with the skins of wild beasts from the inclemencies of the climate." This Aryan society was like that of the Swiss pile-dwellers, whom, indeed, Professor Schrader believes to have been Aryan, drawing attention to the similarities between the results he has derived from his linguistic researches and the discoveries of archæologists in the ruins of the Swiss lake-dwellers of the stone age.

Professor Schrader's "linguistic palæontology," carried on, adds the reviewer, under the salutary control of archæology, leads him to the same conclusions, though by a different road, as Professor Penka, *i. e.*, that Europe, not Asia, was the original home of the Aryan family, as first suggested by Dr. Latham. Mr. Sayce tells us that this theory has recently been gaining ground, remarking: "We now know that it is to the European, rather than to the Indic languages that we must look for the truest representation of primitive Indo-European grammar and phonology. The argument, therefore, formerly used to support the claim of an Asiatic origin for the Indo-European family of speech must now be turned against it."

Penka considers the starting point of Aryan emigration to have been Scandinavia, the Aryan invaders of Northwestern India having been a later and distant offshoot of the primitive stock. Mr. Sayce has been attracted by Poesche's hypothesis, "which makes the Rokytno marshes the original center of the Aryans." However that may be, the evidence is now tending to show that the districts in the neighborhood of the Baltic were those from which the Aryan languages first radiated, and where the race or races who first spoke them originally dwelt.

Thus philology, anthropology, zoölogy and botany now unite in suggesting that the birthplace of the Aryans was in Eastern Europe and the western borders of Asia, rather than the Himalayan plateau. Our Aryan savage ancestors were probably herdsmen and shepherds as well as forest rangers, living partly on the treeless plains of Russia in Europe, and partly in the forest-clad lowlands of Scandinavia and Northeastern Germany.

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RECENT LITERATURE.

MEINERT'S ANATOMY OF THE CENTIPEDE'S HEAD.¹—This memoir is fortunately written in English. It treats in detail of the external anatomy of the parts of the head in Scolopendra (*S. subspinipes* Kohlr.) as most typical of the Chilopods. As a contribution to the morphology of the myriopods it will always be

¹*Caput Scolopendræ. The Head of the Scolopendra and its Muscular System.* By FR. MEINERT. With 3 plates. Copenhagen, 1883. 4to, pp. 77.

valuable, though we doubt if some of the author's views will command general assent. The details appear to have been worked out with care, while the drawings seem to have been very carefully made by the author, and beautifully engraved by Lövendal.

In the course of his lengthy views of the works of his predecessors, the author criticises and disproves Newport's views that the head of chilopods is composed of eight sub-segments. Four pages of the memoir are devoted to an elaborate and useful tabular view of the opinions of forty-six authors as to the morphology and nomenclature of the mouth-parts.

Dr. Meinert gives a new explanation and nomenclature of the mouth-parts. He also claims that they are homologous with those of biting insects, or, to use his own words, set forth in an idiom peculiarly his own, "it is purposed to serve me to show the coincidence of the head of Chilopoda and its parts of the mouth with the head of the Insect and its parts of the mouth, especially in the Orthoptera, that is to say, in insects with free biting parts of the mouth, and four pairs of these parts or four metamers in the head." Here it may be remarked that Meinert does not regard the antennæ and the antennal segment as homologues of the other mouth-parts and segments. In his own words, "The real head then must be said to consist of the three foremost metamers, together with their exponents or limbs; that is to say, the labium, the maxillæ and the mandibles, and besides of the lamina cephalica, which latter, as well as its appendages, the antennæ, I by no means can consider to be homonomeous with the other metamers of the body and of the head, and with their exponents." Meinert's reasons for rejecting the view that the so-called antennal segment is not such, are weak and unsatisfactory; its form is necessarily unlike the other segments, as it constitutes a preoral segment and the front of the head; it is therefore unlike the succeeding segments, though homologous with them. He considers the antennæ as dorsal rather than "ventral (or pleural);" here we think Meinert wrong. Our author does not accept Metschnikoff's views as to the embryology of Chilopods, although the Russian's observations show plainly enough that the antennæ should be regarded as homologues of the other mouth-parts, and Sograff's splendid memoir (published, however, since Meinert's present paper) appears to confirm Metschnikoff's views. Meinert claims that "neither in the Chilopoda nor in the insects can any ventral part be pointed out in the lamina cephalica;" and he also insists that the alimentary canal does not pass through the antennal segment, or, as he calls it, *lamina cephalica*. But if any one will examine Sograff's Figs. 38, 39 and 43, we think that he will admit that Sograff fully proves that, as in insects, the alimentary canal at first opens as a mouth in the middle of the antennal segment, moving back into the mandibular segment in after life, while the antennæ arise as pleural outgrowths in almost exactly

the same manner and relative proportion as the mandibles and maxillæ. Here, as in other memoirs, Meinert lacks breadth and comprehensiveness in his treatment of arthropod morphology. We also think that there is a decided lack of homology between the mouth-parts of myriopods and hexapods, as we have endeavored recently to show, the terms labium, maxillæ and mandibles not being properly applicable to the myriopods, however alike their appendages are in the embryo to those of Hexapoda.

LEYDIG'S RESEARCHES IN ANATOMY AND HISTOLOGY.—Professor Leydig devotes the greater part of his most recent work, "Untersuchungen zur Anatomie und Histologie der Thiere" (Bonn, 1883, pp. 174), to the discussion of the intimate structure of the tissue cells of the Insecta. A few pages treat of the tactile papillæ of the Kentucky blind fish (*Amblyopsis spelæus*), and of the olfactory cones in the cray-fish from the Mammoth cave (*Orconectes pellucidus*). As these forms have been described in detail in earlier volumes of this journal (Jan., '72, Dec., '71), some of the readers of the NATURALIST may be interested in the result of the distinguished histologist's observations.

The tactile papillæ are arranged on the top of the head on ridges, which thus acquire a pectinated appearance (see this Jour., 1871, Pl., Figs. 7, 8, 9, 10). Professor Wyman described a filament projecting out of the funnel-shaped extremity of each papilla, but Leydig denies the existence of the filament, considers that the funnel is occupied in the fresh state by a beaker-shaped sense-organ similar to those met with everywhere in the skin of Teleostei, and suggests that as the thin edge of the funnel is occasionally prolonged into several points, one of these was mistaken for a central filament by Wyman.

In addition to the larger papillæ, isolated smaller ones are scattered over the head and mucous membrane of the mouth, being most frequent on the lips. They are not visible to the naked eye, and in fact generally require the microscope for their demonstration. They are slender and cylindrical, with a slightly broader base and fringed extremity, also hollowed out for the lodgment of a "sense-beaker."

As the want of sight in the blind fish is compensated for by the development of the tactile ridges, so in various Crustacea of the "cave-fauna" it has been noticed that the olfactory cones are present to a much greater number than in allied forms possessed of sight. Professor Leydig was unable to compare *Orconectes pellucidus* in this respect with any of the other North American species, but finds that the external branch of the antennula which bears the olfactory cones has thirty-six segments. The cones are chiefly confined to the middle third of the flagellum, and are there arranged to the number of seven on each segment, three being on the middle and four in a bunch on